Amendments to the Specification

1. Replace paragraph [0002] with one replacement paragraph:

[0002] This invention is about an air sterilizing system, which uses intense 253.7nm wavelength ultraviolet (UV) irradiation to free air from live bacteria, viruses and other microorganisms. The method can also be applied to sterilize ~~any~~ other fluent material, such as gas, ~~including gas, water or other fluids,~~ containing every kind of live microorganisms naturally with or from biological agents used by terrorists or in warfare.

2. Replace paragraph [0005] with one replacement paragraph:

[0005] The worldwide outbreak of SARS (caused by coronaviruses) has become a serious global concern since Jan. 2003. According to WHO, the amplification of transmission within well-equipped hospitals was a striking feature of SARS. In some cases, staff became infected despite wearing full protective equipment. Thus, ~~although SARS is not thought to be an airborne infection,~~ a disproportionately large amount of resources is needed to prevent transmission of airborne infections as compelling evidence states that aerosols and microdroplets with coronaviruses in air may play very important roles in SARS transmission. In the same way, many non-airborne harmful bacteria and viruses can become airborne when they are in the form of aerosols or microdroplets.

3. Replace paragraph [0012] with one replacement paragraph:

[0012] This invention is about an air sterilizing method and apparatus to destroy all live microorganisms in ~~the~~ air in large volumes (300 cfm to 30,000 cfm) to satisfy the increasing needs for the purposes of anti infectious disease and anti-terrorism. These apparatus can sterilize either fresh air or return air before distribution. Or they can be used to sterilize contaminated air before exhausting it to the environment. An apparatus can be designed to kill more than 99.999% of targeting microorganisms in air by employing sufficient 253.7nm ~~for a killing rate higher than 99.999% by adjusting the number of~~ UV lamps and extending the length of the circuitous sterilizing chamber(s). The employment of circuitous chamber(s) ~~is for the purpose of increasing exposure to~~ offers enough space to expose air sterilized to designated amount of UV radiation that is used to kill all live microorganisms that pass through the chamber.

4. Replace paragraph [0013] with one replacement paragraph:

[0013] Since UV radiation at about 253.7nm is very effective in killing microorganisms; the apparatus of this invention are very effective. These apparatus can be added onto ~~existing~~ air conditioning system, or AHU, or stand alone, for hospital, biomedical, pharmaceutical, biotechnology, genetic research, universities, laboratories, food processing, semiconductor fabrication, industrial processing systems, governmental and military buildings, commercial buildings and any public buildings.

5. Replace paragraph [0015] with one replacement paragraph:

[0015] This invention can also be used to sterilizing ~~all~~ other kinds of fluent material, especially gas ~~water~~.

6. Replace paragraph [0020] with one replacement paragraph:

[0020] Depiction of a front elevation view and a top view of the apparatus for sterilizing ~~water~~ air in large volume by radiation of ultraviolet rays according to ~~a~~ another preferred embodiment of this invention.

7. Replace paragraph [0021] with one replacement paragraph:

[0021] Depiction of a front elevation view and a top view of the apparatus for sterilizing ~~water~~ air in large volume by radiation of ultraviolet rays according to another preferred embodiment of this invention.

8. Replace paragraph [0042] with one replacement paragraph:

[0042] Referring to Fig.1, the basic construction of an apparatus for sterilizing air ~~in large volume (300cfm to 30,000cfm)~~ with volume of 5,000cfm and a microorganisms killing rate higher than 99.99% by radiation of 253.7nm wavelength ultraviolet rays in accordance with this invention is shown, including an exterior housing 8 with an air inlet 1, an blower or fan and associated motor 2, an inlet filter unit 3, a ~~roundabout~~ circuitous UV germicidal sterilizing chamber 10 with UV visual inspection windows 5 and UV sensors 6 on it, an air outlet 11 with an inspection window 12 and an outlet filter 13.

9. Replace paragraph [0044] with one replacement paragraph:

[0044] As better shown in Fig. 2, within the inlet 1, there is preferably a blower or fan and associated motor 2 to give air enough power to go through the apparatus. Connected to the inlet 1, there is an inlet filter unit 3 so that all air drawn through the inlet 1 must pass through the inlet filter 3 before entering the chamber 10. The basic function of the inlet filter unit 3 is intercepting and retaining any ~~fairly large particles (1um to 10um) to increase UV killing power and~~ particles larger than 1um to guarantee UV irradiation killing power and to protect UV lamp tubes 15 from dust in said chamber 10 where air flows in from the inlet filter unit 3 to the outlet filter unit 13.

10. Replace paragraph [0045] with one replacement paragraph:

[0045] The air outlet 11 is preferably positioned on the top of the housing 8 so that the sterilized discharging air can easily goes into the air distribution duct (not shown) that leads to every rooms in a building, or into air exhaust pipe(s) (not shown) to the air outside. Between the sterilizing chamber and the outlet, there is an outlet filter unit 13. The purpose of this filter is to prevent particles from getting

into the air distribution duct. So, the outlet filter unit 13 can be designed according to the requirements of applications, such as ~~from~~ HVAC filters or ~~to~~ HEPA/ULPA filters, preferably HEPA filters for most of the applications. On the outlet 11, there is an inspection window 12 for taking air samples for live microorganism's inspection to supervise sterilizing effect and air quality.

11. Replace paragraph [0046] with one replacement paragraph:

[0046] In the sterilizing chamber 10, which is constructed basically by the six sides of the housing 8 and internally built as continually circuitous tunnel by interior walls, there is always a curved (circular) flow guiding interior 7 to make a smooth ~~roundabout~~ turn wherever the air flow turns its direction in the chamber 10 to reduce flow resistance. The interior wall surfaces 9 of the sterilizing chamber 10 is made with anti-ultraviolet, light reflecting material with mirror surface to increase the interior UV light reflection and thus increase the UV sterilizing effect. The length ~~of the tunnel~~ and/or the number of ~~roundabouts~~ turns of the chamber 10 can be reduced or increased according with the designated number of UV lamps to be installed. The opening size of the sterilizing chamber 10 is mainly decided by the volume of air to be sterilized. Normal sizes include, but not limit to, 1'X1', 1'X2', 2'X2', 2'X3', 3'X3', 3'X4', 4'X4'.

12. Replace paragraph [0048] with one replacement paragraph:

[0048] The fundamental difference of this invention from prior art methods and apparatus that were thought having the ability to kill all of microorganisms with only one, two or three UV lamps in a wink is the UV ~~radiation intensity~~ irradiation amount. This invention has not only offering much higher UV killing power to microorganisms than prior art methods but also the ability to offer any amount of 254nm germicidal UV radiation required for destruction of any kind of targeting microorganism. ~~The basic formula is that the amount of UV power multiplying exposure time must be higher than the UV death value of any microorganisms. In other words, the sterilizing dosage of UV radiation should be high enough that there will not be any microorganism survived.~~

13. Replace paragraph [0049] with one replacement paragraph:

[0049] In order to accomplish this goal, a circuitous sterilizing chamber 10 is employed, which offers a flexible infrastructure to meet different needs such as different killing rate to microorganisms and/or different volume of air sterilized. ~~which can increase both the traveling time of the sterilized air and the number of UV lamps installed, is employed. In order to get ideal UV intensity~~ The length and the number of turns of the chamber 10 can be increased or reduced to the point of enough space available to install designated number of UV lamps to satisfy the amount of germicidal UV irradiation required for destruction of targeting microorganisms when dealing certain volume of air. And the distance between any two UV lamps is preferably about 3" to 1'. They can line up in any pattern. In the preferred embodiment of this invention, there are 98 UV lamps tubes 15 in two rows along the circuitous sterilizing chamber 10. These lamps are fixed on both

front and rear side of the chamber 10. ~~Increasing the number of UV lamps can increase the sterilizing power of the apparatus. The length and roundabouts of the chamber 10 can also be increased to get more space to install UV lamps.~~

14. Replace paragraph [0052] with one replacement paragraph:

[0052] FIG.5 depicts another preferred embodiment of this invention. This embodiment is with a different inlet orientation. ~~an apparatus for sterilizing water in large volume by radiation of ultraviolet rays according to a preferred embodiment of this invention. Water goes through the inlet valve 17, inlet 1, and inlet filter unit 3 then into the circuitous sterilizing chamber 10. The distance between any two UV lamps is preferably about 2" to 6". The sterilized water discharges through outlet filter unit 13, outlet 11, and then outlet valve 18. There is sample faucet 12 for water quality supervision.~~

15. Replace paragraph [0053] with one replacement paragraph:

[0053] FIG.6 depicts another preferred embodiment of this invention. ~~an apparatus for sterilizing water in large volume by radiation of ultraviolet rays according to another preferred embodiment of this invention.~~ This embodiment constructs a spiral-sterilizing chamber 10, which has lower flow resistance. ~~resistance, and more space to install UV lamps. The distance between any two UV lamps is preferably about 2" to 6". The sterilized water discharges through outlet filter unit 13, outlet 11, and then outlet valve 18. There is sample faucet 12 for water quality supervision.~~

16. Replace paragraph [0054] with one replacement paragraph:

[0054] Other alternate embodiments may be devised without departing from the spirit or the scope of the invention. ~~For example, the apparatus depicts in FIG. 6 can be adapted for sterilizing air, and small apparatus can be devised for sterilizing transportation vehicles and residential shelters.~~

17. Replace Abstract with one replacement paragraph:

A sterilizing method and apparatus for destroying live microorganisms including viruses in fluent material, such as air ~~and water~~, in large volume. As a preferred embodiment of this invention, air is draw, from the inlet 1, through the inlet filter unit 3 and into the circuitous sterilizing chamber 10 that is irradiated by numbers of UV lamp tubes 15, and through the discharging filter unit 13 and then out through outlet 11. A sample window 12 is built in for quality supervision. Visual inspection windows 5 and UV sensors 6 are provided for easy supervision and auto-control. The sterilizing chamber 10 also includes flow resistant reducing feature 7 and internal light reflecting surfaces 9.